

We claim:

1. A process for preparing a stable aqueous copolymer dispersion by free-radically initiated aqueous emulsion polymerization of

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- a) from 19.9 to 80 parts by weight of conjugated aliphatic dienes,
- b) from 19.9 to 80 parts by weight of vinylaromatic compounds,
- c) from 0.1 to 10 parts by weight of ethylenically unsaturated carboxylic acids and/or dicarboxylic acids,
- 10 d) from 0 to 20 parts by weight of ethylenically unsaturated carbonitriles,

and

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- e) from 0 to 20 parts by weight of copolymerizable compounds other than monomers b),

the total amount of ethylenically unsaturated monomers a) to e) being 100 parts by weight, in the presence of water and from 0.1 to 5 parts by weight, based on the total monomer amount, of emulsifiers comprising

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- f) sulfuric monoesters of ethoxylated fatty acid alcohols and/or
- g) salts of esters and monoesters of alkylpolyoxyethylenesulfosuccinates,

from 15 to 85% by weight of the total emulsifiers used being added within the time taken to reach up to 40% of the total conversion of the monomers a) to e), and from 1 to 50% of the carboxylic acid groups deriving from the monomers c) being neutralized by addition of base, wherein the partial neutralization of the monomers c) takes place before the polymerization.

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2. A process as claimed in claim 1, wherein components a) to g) are supplied to the polymerization reactor during the polymerization via a common supply line.

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3. A process as claimed in claim 2, wherein components a) to g) and at least part of the water are mixed to an emulsion by a mixing means during their supply.

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4. A process as claimed in claim 3, wherein said mixing means comprises at least one static mixer, one dynamic mixer and/or one mixing nozzle.

5. A process as claimed in any of claims 2 to 4, wherein at least part of the base required for partial neutralization of the monomers c) is metered into the common supply line.

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6. A process as claimed in claim 5, wherein at least part of the base required for partial neutralization of the monomers c) is metered into the common supply line upstream of the mixing means.

7. A process as claimed in any of claims 1 to 6, wherein the free-radically initiated aqueous emulsion polymerization is conducted in the presence of a polymer seed.
- 5 8. A process as claimed in claim 7, wherein at least part of the water and, if desired, parts of one or more of components a) to g) and also parts or all of a polymer seed or of further, customary additives are charged to the polymerization reactor and the remainders of these components are supplied to the liquid phase of the reaction mixture after the free-radical polymerization has been initiated.